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1 a.	Leaves about 1/8 in. or less broad, often evergreen.....	2.
b.	Leaves more than 1/4 in. broad.....	34.
2 a.	Leaves scale-like, more or less appressed to the stem, the tips sometimes spreading.....	3.
b.	Leaves awl-shaped, linear, or needle-like, not appressed to the stem....	6.
3 a.	Branchlets appear more or less 4-sided, not flattened laterally; all leaves more or less keeled.....	Red Cedar. (<i>Juniperus virginiana.</i>)
b.	Branchlets appear much flattened laterally, two rows of leaves flat and two rows keeled or ridged.....	4.
4 a.	Branchlets about 1/16 in. broad, the flat leaves with a discoid marking on the back.....	Southern White Cedar. (<i>Chamaecyparis thyoides.</i>)
b.	Branchlets about 1/6 in. broad.....	5.
5 a.	Branchlets lighter colored beneath....	Arbor Vitae. (<i>Thuja occidentalis.</i>)
b.	Branchlets alike on both sides.	Oriental Arbor Vitae. (<i>Thuja orientalis.</i>)
6 a.	Leaves in clusters on the stem.....	7.
b.	Leaves attached singly to the stem.....	20.
7 a.	Leaves 2-5 in a cluster.....	8.
b.	Leaves 10 or more in a cluster.....	17.
8 a.	Leaves in clusters of 5, or some in 4's.....	9.
b.	Leaves in clusters of 2 or 3.....	11.
9 a.	Leaves 5-8 in. long, drooping, the young branches whitish; cultivated tree.	Bhotan Pine. (<i>Pinus excelsa.</i>)
b.	Leaves 2-5 in. long, not drooping, young branches not whitish.....	10.
10 a.	Young branches covered with brownish hairs; mature cones 2-4 in. long; cultivated tree.....	Swiss Stone Pine. (<i>Pinus cembra.</i>)
b.	Young branches not covered with brownish hairs; mature cones 3-6 in. long; native tree, often planted.....	White Pine. (<i>Pinus Strobus.</i>)
11 a.	Leaves in clusters of 3.....	12.
b.	Leaves in clusters of 2, or some in 3's.....	13.
12 a.	Cultivated tree; mature cones 4-6 in. long.	Western Yellow Pine. (<i>Pinus ponderosa.</i>)
b.	Native tree; mature cones 2-3 in. long...Pitch Pine. (<i>Pinus rigida.</i>)	
13 a.	Average leaf less than 4 in long.....	14.
b.	Average leaf 4 in. or more long.....	15.

* This key is designed to be used in the field to determine the trees to be found growing in the eastern United States. In using the key begin with No. 1, read both *a* and *b* and choose the one which fits the specimen; follow the key as indicated by the number to which you are referred each time, reading both *a* and *b* until the name of the specimen is obtained. Accuracy in observation and in following the key are of first importance, choosing an average specimen is likewise important. Additional copies of this key may be had for 10 cents by addressing the author at Columbia University, New York City.

- 14 a. Leaves 1-3 in. long, dark green; native tree.
Jersey Pine. (*Pinus virginiana*.)
 b. Leaves about 3 in. long, twisted, rather light green; cultivated tree.
Scotch Pine. (*Pinus sylvestris*.)
- 15 a. Cultivated tree; leaves much clustered at the ends of the branches; mature cones 2-3 in. long.....**Austrian Pine.** (*Pinus austriaca*.)
 b. Native tree; leaves not noticeably clustered at the ends of the branches; mature cones 1-2 in. long.16.
- 16 a. Some leaves on the branch in clusters of 3, others in 2's.
Yellow Pine. (*Pinus echinata*.)
 b. All leaves in clusters of 2.....**Red Pine.** (*Pinus resinosa*.)
- 17 a. Leaves deciduous, borne on short bud-like branches.....18.
 b. Leaves evergreen, not borne on short bud-like branches.....19.
- 18 a. Leaves about 3/4 in. long; mature cones about 1 1/2 in. long; native tree.
Tamarack. (*Larix laricina*.)
 b. Leaves about 1 in. long; mature cones about 1 in. long; cultivated tree.
European Larch. (*Larix decidua*.)
- 19 a. Leaves 1/2-3/4 in. long; mature cones 2-3 in. long.
African Cedar. (*Cedrus Atlantica*.)
 b. Leaves 1-3 in. long; mature cones 3-5 in. long.
Cedar-of-Lebanon. (*Cedrus Libani*.)
- 20 a. Leaves 3-6 in. long, in whorls at the ends of the branches; small cultivated tree.....**Umbrella Pine.** (*Sciadopitys verticillata*.)
 b. Leaves 2 in. or less long.....21.
- 21 a. Each leaf extends down the stem, not jointed to it; leaves awl-shaped, rigid; small cultivated tree.....**Japanese Cedar.** (*Cryptomeria japonica*.)
 b. Trees not completely as in a.....22.
- 22 a. Leaves thick, somewhat 4-sided; branches very rough when leaves are removed.....23.
 b. Trees not completely as in a.....26.
- 23 a. Leaves 1/4-1/2 in. long, crowded, appressed to the branches.
Oriental Spruce. (*Picea orientale*.)
 b. Leaves 1/2-1 in. long, not appressed to the branches.....24.
- 24 a. Leaves bluish or whitish, strongly incurved on the upper branches.
Blue Spruce. (*Picea pungens*.)
 b. Leaves not completely as in a.....25.
- 25 a. Leaves usually 3/4-1 in. long; mature cones 4-6 in. long; cultivated tree.
Norway Spruce. (*Picea Abies*.)
 b. Leaves usually 1/2 in. long; mature cones 1-2 in. long; native tree.
Black Spruce. (*Picea Mariana*.)
- 26 a. Leaves rigid, tapering to the apex; some leaves usually scale-like.
Red Cedar. (*Juniperus virginiana*.)
 b. Leaves not completely as in a.....27.
- 27 a. Leaves deciduous, appearing only on the present year's branches; the young branches often deciduous.....**Cypress.** (*Taxodium distichum*.)
 b. Leaves evergreen, appearing on 2-year old branches.....28.
- 28 a. Branches covered with small projections to which the leaves are attached.....29.
 b. Branches without projections, rather smooth when leaves are removed.....30.

- 29 a. Leaves blunt at apex, about $1\frac{1}{2}$ in. long, with two white lines beneath when fresh **Hemlock.** (*Tsuga canadensis*.)
 b. Leaves somewhat pointed at apex, $3\frac{1}{4}$ –1 in. long. **European Yew.** (*Taxus baccata*.)
- 30 a. Leaves pointed at the apex. **Cephalonian Silver Fir.** (*Abies cephalonica*.)
 b. Leaves blunt or notched at the apex. 31.
- 31 a. Leaves blue-green, usually glaucous on the young shoots, often 4-sided. **Red Fir.** (*Abies nobilis*.)
 b. Leaves dark green and shining above, whitish beneath. 32.
- 32 a. Native tree; leaves about $3\frac{1}{4}$ in. long; mature cones 2–4 in. long. **Balsam Fir.** (*Abies balsamea*.)
 b. Cultivated trees; average leaves usually more than $3\frac{1}{4}$ in. long; mature cones 4–6 in. long. 33.
- 33 a. Leaves tapering to the base, somewhat curved. **Northern Silver Fir.** (*Abies nordmanniana*.)
 b. Leaves not completely as in a. **Silver Fir.** (*Abies Picea*.)
- 34 a. Leaves or leaf scars opposite on the branch. 35.
 b. Leaves or leaf scars alternate on the branch. 58.
- 35 a. Leaves simple. 36.
 b. Leaves compound. 50.
- 36 a. Leaves with entire or wavy margin. 37.
 b. Leaves with toothed or lobed margins. 40.
- 37 a. Leaves ovate, 2–5 in. long; small tree with bark peeling off in small rectangular patches. **Flowering Dogwood.** (*Cornus florida*.)
 b. Leaves broadly ovate; trees with rather smooth or flaky bark. 38.
- 38 a. Leaves 2–3 in. long with wavy margins; cultivated tree. **Cercidiphyllum.** (*Cercidiphyllum japonicum*.)
 b. Leaves 6–12 in. long with entire margins. 39.
- 39 a. Fruit of long pods 8–20 in. long. **Catalpa.** (*Catalpa Catalpa*.)
 b. Fruit of short capsules 1–2 in. long. **Empress Tree.** (*Paulownia tomentosa*.)
- 40 a. Leaves sharply toothed, not lobed, the teeth about $1\frac{1}{4}$ in. long; cultivated tree. **Hornbeam Maple.** (*Acer carpinifolium*.)
 b. Leaves more or less lobed. 41.
- 41 a. Leaves very deeply 7–11-lobed, the lobes linear to lanceolate, narrow, sometimes relobed; cultivated tree. **Japanese Maple.** (*Acer palmatum*.)
 b. Leaves not completely as in a. 42.
- 42 a. Leaves nearly circular in outline, 5–9-lobed, the lobes doubly toothed; cultivated tree. **Round-leaved Maple.** (*Acer circinatum*.)
 b. Leaves not completely as in a. 43.
- 43 a. Leaves 3-lobed only toward the apex, the margins finely toothed all around; bark smooth, green, striped. **Striped Maple.** (*Acer pennsylvanicum*.)
 b. Leaves and bark not completely as in a. 44.
- 44 a. Leaves with indentations extending more than half way to the petiole, whitish beneath; bark peeling off in thin flakes; branches often upturned at the ends. **Silver Maple.** (*Acer saccharinum*.)
 b. Trees not completely as in a. 45.
- 45 a. Leaves 3–7-lobed, the lobes entire or the middle one sometimes slightly toothed; cultivated trees. 46.

- b. Leaves with lobes more or less toothed or relobed.....47.
- 46 a. Branches corky; leaves 3-5-lobed, the lobes blunt at apex.
English Maple. (*Acer campestre*.)
 b. Branches not corky; leaves 5-7-lobed, the lobes pointed.
Colchicum-leaved Maple. (*Acer laetum*.)
- 47 a. Leaves usually 3-lobed, the lobes toothed; petiole and twigs usually red;
 bark usually smooth and light gray, usually rough only toward the base.
Red Maple. (*Acer rubrum*.)
 b. Trees not completely as in a.....48.
- 48 a. Lobes of leaves many-toothed, the teeth usually rounded, not with bristly
 tips.....**Sycamore Maple.** (*Acer pseudo-platanus*.)
 b. Lobes of leaves with 2-4 coarse teeth, the teeth usually pointed or with
 bristly tips.....49.
- 49 a. Cultivated tree; leaves 4-7 in. broad; bark smooth or short-furrowed.
Norway Maple. (*Acer platanoides*.)
 b. Native tree; leaves 3-6 in. broad; bark peeling in elongated flakes.
Sugar Maple. (*Acer Saccharum*.)
- 50 a. Leaves palmately compound.....51.
 b. Leaves pinnately compound.....52.
- 51 a. Fruit prickly; tree rather commonly planted.
Horse-chestnut. (*Aesculus Hippocastanum*.)
 b. Fruit not prickly; tree not very commonly planted.
Ohio Buckeye. (*Aesculus glabra*.)
- 52 a. Leaflets 3 or 5, coarsely toothed or lobed...**Box Elder.** (*Acer Negundo*.)
 b. Leaflets 7 or more.....53.
- 53 a. Fruit berry-like; bark corky....**Cork Tree.** (*Phellodendron amurense*.)
 b. Fruit winged; bark not corky.....54.
- 54 a. Lateral leaflets stalked.....55.
 b. Lateral leaflets not stalked.....56.
- 55 a. Fruit with wing nearly all terminal on the seed.
White Ash. (*Fraxinus americana*.)
 b. Fruit with wing extending about half way down on the seed.
Red Ash. (*Fraxinus pennsylvanica*.)
- 56 a. Trees growing wild, in moist places.....**Black Ash.** (*Fraxinus nigra*.)
 b. Cultivated trees.....57.
- 57 a. Fruit 3/4-1 in. long; leaflets usually entire.
Flowering Ash. (*Fraxinus ornus*.)
 b. Fruit 1-2 in. long; leaflets usually toothed.
English Ash. (*Fraxinus excelsior*.)
- 58 a. Leaves compound, composed of 3 or more leaflets.....59.
 b. Leaves simple.....75.
- 59 a. Leaflets usually 2 in. or less long, with entire margins; fruit a pod....60.
 b. Some or all of the leaflets more than 2 in. long, with entire or toothed
 margins.....63.
- 60 a. Trees usually with thorns 1 in. or more long on the trunk; leaves usually
 doubly compound; pods 10 in. or more long, flat.
Thorny Locust. (*Gleditsia triacanthos*.)
 b. Trees not completely as in a.....61.

- 61 *a.* Leaves doubly compound; pods 6–10 in. long.
Coffee-tree. (*Gymnocladus dioica.*)
b. Leaves singly compound; pods 6 in. or less long.....62.
- 62 *a.* Usually short spines at the base of the petiole in place of stipules; branches zigzag; pods about 4 in. long; bark with long furrows.
Black Locust. (*Robinia pseudacacia.*)
b. No spines at base of leaves as in *a.*; cultivated tree.
Pagoda Tree. (*Sophora japonica.*)
- 63 *a.* Leaflets with entire margins; cultivated tree.
Yellow-wood. (*Cladrastis lutea.*)
b. Leaflets with margins more or less toothed or incised.....64.
- 64 *a.* Leaflets with only 2–8 teeth at the base; fruit winged.
Ailanthus. (*Ailanthus glandulosa.*)
b. Leaflets not completely as in *a.*.....65.
- 65 *a.* Leaflets irregularly toothed or incised; cultivated tree.
Varnish Tree. (*Koelreuteria paniculata.*)
b. Leaflets more or less regularly toothed.....66.
- 66 *a.* Leaflets toothed towards the apex, usually less than 1 in. broad; fruit of red berries.....**Mountain Ash.** (*Sorbus americana.*)
b. Leaflets usually toothed all around; fruit of nuts.....67.
- 67 *a.* Leaflets 13–25 to each leaf.....68.
b. Leaflets 5–11.....70.
- 68 *a.* Cultivated tree; nuts with wings about 3/4 in. broad.
Caucasian Walnut. (*Pterocarya fraxinifolia.*)
b. Native trees; nuts not winged.....69.
- 69 *a.* Leaflets with sticky hairs; nut oblong....**Butternut.** (*Juglans cinerea.*)
b. Leaflets not with sticky hairs; nut globose...**Black Walnut.** (*Juglans nigra.*)
- 70 *a.* Cultivated tree; shuck of nut not splitting.
English Walnut. (*Juglans regia.*)
b. Native trees; shuck splitting from the nut.....71.
- 71 *a.* Bark of trunk shaggy in older trees; leaflets usually 5.....72.
b. Bark not shaggy; leaflets 5–11.....73.
- 72 *a.* Nut about 3/4 in. or more broad; shuck comparatively thick; common tree.
Shagbark Hickory. (*Hicoria ovata.*)
b. Nut less than 3/4 in. broad; shuck comparatively thin; tree not common.
Small-fruited Hickory. (*Hicoria microcarpa.*)
- 73 *a.* Terminal bud yellowish, without thin scales; leaflets 7–11.
Bitternut Hickory. (*Hicoria minima.*)
b. Terminal bud not yellowish, with thin scales; leaflets 5–9.....74
- 74 *a.* Twigs covered with hairs just back of the terminal bud; leaflets usually 7; shuck of nut comparatively thick.....**Mockernut.** (*Hicoria alba.*)
b. Twigs not covered with hairs as in *a.*; leaflets usually 5; shuck of nut thin.
Pignut. (*Hicoria glabra.*)
- 75 *a.* Trees with light colored patches on the upper trunk and branches where bark has peeled; fruit globose with stems 2 in. or more long.....76.
b. Tress not completely as in *a.*.....77.
- 76 *a.* Fruit in clusters of 2 or more...**Oriental Sycamore.** (*Platanus orientalis.*)
b. Fruit single, not in clusters...**American Sycamore.** (*Platanus occidentalis.*)

- 77 *a.* Leaves somewhat fan-shaped, the apex usually deeply incised; cultivated tree..... **Maiden-hair Tree.** (*Ginkgo biloba.*)
- b.* Leaves not completely as in *a.*.....78.
- 78 *a.* Leaves broadly notched at apex, usually with 2 lateral and 2 basal lobes; fruit cylindrical... **White Wood. Tulip Poplar.** (*Liriodendron tulipifera.*)
- b.* Leaves not notched at apex, usually pointed.....79.
- 79 *a.* Leaves somewhat star-shaped, 5-7-pointed, deep red in autumn; fruit globose, prickly; twigs often with wings of cork.
- Sweet Gum.** (*Liquidambar styraciflua.*)
- b.* Leaves not star-shaped.....80.
- 80 *a.* Bark spicy; leaves with 1-3 lobes or some not lobed.
- Sassafras.** (*Sassafras Sassafras.*)
- b.* Trees not completely as in *a.*.....81.
- 81 *a.* Leaves with entire or smooth margins.....82.
- b.* Leaves with toothed or lobed margins.....89.
- 82 *a.* Small trees usually with thorns on the branches; fruit globose, 2 in. or more in diameter; a milky sap often exudes from cut or broken twigs.
- Mock Orange.** (*Toxylon pomiferum.*)
- b.* Trees not completely as in *a.*.....83.
- 83 *a.* Branches conspicuously massed toward the top of trees, horizontal, often drooping; bark often checkered; leaves usually red in autumn; fruit berry-like..... **Sour Gum. Tulepo.** (*Nyssa sylvatica.*)
- b.* Trees not completely as in *a.*.....84.
- 84 *a.* Leaves whitish beneath, rather thick.... **Magnolia.** (*Magnolia virginiana.*)
- b.* Leaves not whitish beneath.....85.
- 85 *a.* Leaves 10-24 in. long..... **Umbrella Tree.** (*Magnolia tripetala.*)
- b.* Leaves 5 in. or less long.....86.
- 86 *a.* Fruit somewhat fluffy, in large panicles, very conspicuous on the small tree.
- Smoke Tree.** (*Cotinus cotinoides.*)
- b.* Trees not completely as in *a.*.....87.
- 87 *a.* Leaves somewhat rounded; fruit a pod.. **Judas Tree.** (*Cercis canadensis.*)
- b.* Leaves oval to lanceolate.....88.
- 88 *a.* Leaves oval; fruit fleshy; bark in patches.
- Persimmon.** (*Diospyros virginiana.*)
- b.* Leaves linear-lanceolate; fruit an acorn.
- Willow Oak.** (*Quercus Phellos.*)
- 89 *a.* Leaves with margins more or less lobed, with more than 3 lobes; fruit an acorn.....90.
- b.* Leaves usually with toothed margins, sometimes with 2 or 3 lobes; or palmately veined; fruit not an acorn or wanting.....101.
- 90 *a.* Lobes of leaves more or less pointed or with bristly tips; cup of acorn with comparatively smooth scales on the outside.....91.
- b.* Lobes of leaves more or less rounded, not with bristly tips; cup of acorn rough on the outside.....95.
- 91 *a.* Average leaf 3-5 in. long; branches conspicuously horizontal or drooping, and low down on the trunk; acorn about 1/2 in. long.
- Pin Oak.** (*Quercus palustris.*)
- b.* Trees not completely as in *a.*.....92.

- 92 *a.* Leaves conspicuously wedge-shaped with 3-5 rather short, rounded lobes with bristly tips.....**Black-jack Oak.** (*Quercus marylandica.*)
b. Lobes of leaves pointed.....93.
- 93 *a.* Cup of acorn shallow, saucer-shaped, enclosing $1/8-1/4$ of the mature acorn; lobes of leaves usually triangular.....**Red Oak.** (*Quercus rubra.*)
b. Cup of acorn encloses about $1/2$ of the mature acorn; lobes of leaves not usually triangular.....94.
- 94 *a.* Inner bark yellow or orange and very bitter; scales of cup fringed or reflexed about the top of cup; lobes of leaf often at right angles to the midrib.
Black Oak. (*Quercus velutina.*)
b. Inner bark not as in *a.*; scales of cup usually compressed about the acorn; lobes of leaves often relobed toward outer ends.
Scarlet Oak. (*Quercus coccinea.*)
- 95 *a.* Bark on trunk furrowed, dark gray.....96.
b. Bark on trunk flaky, usually light gray.....98.
- 96 *a.* Cup of acorn fringed; leaves usually regularly lobed; cultivated tree.
Turkey Oak. (*Quercus cerris.*)
b. Cup of acorn not fringed.....97.
- 97 *a.* Native tree; leaves regularly lobed; cup enclosed about $1/4$ or less of the acorn; bark with very hard triangular ridges.
Rock Chestnut Oak. (*Quercus prinus.*)
b. Cultivated tree; leaves variously lobed; cup encloses $1/3$ or more of the acorn.
English Oak. (*Quercus pedunculata.*)
- 98 *a.* Lobes of leaves short, the indentations about $1/4$ the distance to the midrib; bark very loose on the smaller branches; cup with stalk 2-4 in. long.
Swamp White Oak. (*Quercus platanooides.*)
b. Trees not completely as an *a.*99.
- 99 *a.* Lobes of leaves usually narrow toward the base, often relobed at the apex; leaves usually thick and with brownish hairs beneath.
Post Oak. (*Quercus minor.*)
b. Leaves not completely as in *a.*100.
- 100 *a.* Cup conspicuously fringed at top, mossy; tree not common.
Bur Oak. (*Quercus macrocarpa.*)
b. Cup not fringed at top; tree common...**White Oak.** (*Quercus alba.*)
- 101 *a.* Bark smooth, dark gray, the trunk ridged or sinew-like; fruit with leaf-like wings, in pairs.....**Blue Beech.** (*Carpinus caroliniana.*)
b. Trees not completely as in *a.*102.
- 102 *a.* Bark smooth, light gray, without horizontal markings; terminal bud slender, tapering, $1/2-1$ in. long.....103.
b. Bark and terminal buds not completely as in *a.*104.
- 103 *a.* Leaves hairy beneath, sometimes purplish; cultivated species.
European Beech. (*Fagus sylvatica.*)
b. Leaves not hairy beneath; native species.
American Beech. (*Fagus grandifolia.*)
- 104 *a.* Leaves with margin toothed only toward apex, entire toward the base; fruit berry-like, sweet; bark on trunk often corky at base.
Hackberry. (*Celtis occidentalis.*)
b. Leaves toothed all around the margin.....105.

- 105 *a.* Leaves 5 in. or more long, with very sharply toothed margins; fruit a prickly bur.....106.
b. Leaves and fruit not completely as in *a.*.....107.
 106 *a.* Native tree; leaves tapering to the apex.

American Chestnut. (*Castanea dentata.*)

- b.* Cultivated tree; leaves abruptly pointed at apex.

European Chestnut. (*Castanea sativa.*)

- 107 *a.* Leaves somewhat rounded, often unequal at the base; fruit leaf-like with small globose nutlets attached; buds often reddish and placed to one side of the leaf-scar.....108.
b. Trees not completely as in *a.*.....110.
 108 *a.* Leaves white-woolly beneath; cultivated tree.

Silver Linden. (*Tilia tomentosa.*)

- b.* Leaves not white-woolly beneath.....109.
 109 *a.* Cultivated tree; leaves with a tuft of wool in the axils of the veins beneath.

European Linden. (*Tilia vulgaris.*)

- b.* Native tree; leaves not usually as in *a.*.....**Basswood.** (*Tilia americana.*)
 110 *a.* Bark on trunk peels off in elongated, rather regular vertical strips; fruit hop-like.....**Ironwood.** (*Ostrya virginiana.*)
b. Bark and fruit not completely as in *a.*.....111.
 111 *a.* Leaves usually irregularly and deeply toothed or lobed; palmately veined; thorns usually present on the branches; fruit somewhat fleshy....112.
b. Trees not completely as in *a.*.....119.
 112 *a.* Thorns more or less curved; leaves broadly ovate, doubly toothed....113.
b. Thorns straight; leaves obovate or ovate.....115.
 113 *a.* Lower surface of leaves densely hairy; fruit with hairy stalks.

Red-fruited Thorn. (*Crataegus mollis.*)

- b.* Lower surface of leaves not densely hairy.....114.
 114 *a.* Leaves rounded or heart-shaped at base.

Washington Thorn. (*Crataegus cordata.*)

- b.* Leaves usually tapering at the base.

Pruinose Thorn. (*Crataegus pruinosa.*)

- 115 *a.* Thorns 1/2 in. or less long; leaves ovate, 3-15-lobed or cleft; cultivated tree.
English Hawthorn. (*Crataegus oxyacantha.*)

- b.* Thorns 3/4 in. or more long.....116.
 116 *a.* Fruit solitary or 2-3 together, yellow when ripe; margin of leaves with broad teeth.....**Dwarf Thorn.** (*Crataegus uniflora.*)
b. Fruit 3 or more together, usually red when ripe.....117.
 117 *a.* Leaves usually shining above, not doubly toothed; stalks of fruit not hairy.

Cockspur Thorn. (*Crataegus crus-galli.*)

- b.* Leaves not shining above, usually doubly toothed; stalks of fruit hairy..118.
 118 *a.* Fruit about 1/2 in. in diameter, reddish-brown when ripe; leaves lobed.

Red Haw. (*Crataegus coccinea.*)

- b.* Fruit 1/2-1 in. in diameter, yellow or red when ripe; leaves not usually lobed.

Large-fruited Thorn. (*Crataegus punctata.*)

- 119 *a.* Bark on trunk and on branches with horizontal markings usually 1/2 in. or more long, usually 1/4 in. or less broad; bark not with regular longitudinal furrows.....120.

- b. Bark not completely as in *a.*.....127.
 120 *a.* Leaves triangular in shape.....121.
 b. Leaves rather ovate to oblong in shape.....122.
 121 *a.* Bark close on trunk not in loose sheets; native tree.

Gray Birch. (*Betula populifolia.*)

- b. Bark in rather loose sheets on the trunk; cultivated tree.

European White Birch. (*Betula alba.*)

- 122 *a.* Bark creamy white, in rather loose sheets on the trunk of older trees.

Paper Birch. (*Betula papyrifera.*)

- b. Bark yellowish, gray, or brown, not whitish.....123.
 123 *a.* Bark yellowish, in rather thin loose sheets on the trunk.

Yellow Birch. (*Betula lutea.*)

- b. Bark not yellowish.....124.
 124 *a.* Fruit usually present on the tree, consisting of hard or woody aments; short twigs present on the branches; bark of twigs not bitter; leaves rather ovate.....125.
 b. Fruit not present; bark of twigs bitter.....126.
 125 *a.* Bark greenish-brown to reddish, in thin loose layers; bark not usually sweet nor aromatic; trees usually growing in damp places.

Red Birch. (*Betula nigra.*)

- b. Bark dark-brown or ashy-gray, close on the trunk or peeling in flakes or plates; bark sweet and aromatic; common tree in rather dry places.

Sweet Birch. (*Betula lenta.*)

- 126 *a.* Leaves mostly oblong, teeth on margin usually incurved; often brownish hairs along the midvein beneath...**Black Cherry.** (*Prunus serotina.*)
 b. Leaves mostly obovate; teeth on margin somewhat spreading, usually pointed.....**Choke Cherry.** (*Prunus virginiana.*)
 127 *a.* Leaves with all secondary veins parallel, prominent and oblique to the midrib.

128.

- b. Leaves not with secondary veins parallel as in *a.*.....131.
 128 *a.* Fruit cone-like; leaves with the blade equal at the base.

European Alder. (*Alnus glutinosa.*)

- b. Fruit always wanting; leaves with blade usually unequal at the base; outer bark often somewhat corky.....129.
 129 *a.* Leaves not noticeably rough above; buds not hairy.

American Elm. (*Ulmus americana.*)

- b. Leaves rough on upper surface; buds hairy.....130.
 130 *a.* Native tree; upper branches drooping and slender; tree usually growing in moist places.....**Slippery Elm.** (*Ulmus fulva.*)
 b. Cultivated tree; upper branches ascending or horizontal, rather coarse.

English Elm. (*Ulmus campestris.*)

- 131 *a.* Leaves usually not more than twice as long as broad; lateral buds with numerous scales.....132.
 b. Leaves usually more than twice as long as broad; lateral buds with a single scale.....141.
 132 *a.* Petioles of leaves flattened laterally.....133.
 b. Petioles of leaves not flattened laterally.....136.
 133 *a.* Leaves white-woolly beneath and lobed...**White Poplar.** (*Populus alba.*)
 b. Leaves not completely as in *a.*.....134.

- 134 a. Leaves more or less triangular in shape.....135.
 b. Leaves not triangular.....136.
 135 a. Leaves 2-3 in. broad, branches erect or ascending.

Lombardy Poplar. (*Populus italica*.)

- b. Leaves 3-7 in. broad; branches more or less spreading.

Cottonwood. (*Populus deltoides*.)

- 136 a. Terminal bud about 1/2 in. or more long, usually pointed.....137.
 b. Terminal bud 1/4 in. or less long, usually rounded.....138.
 137 a. Leaves ovate, the margins usually with large irregular teeth 1/8 in. or more long.....**Large-toothed Aspen.** (*Populus grandidentata*.)
 b. Leaves round-heart-shaped, 1-3 in. broad, the margin with rather small regular teeth usually less than 1/8 in. long.

American Aspen. (*Populus tremuloides*.)

- 138 a. Leaves fragrant when crushed, not densely hairy when young, the apex usually tapering.....**Balm-of-Gilead.** (*Populus candicans*.)
 b. Leaves not fragrant when crushed, densely hairy when young, the apex blunt, the basal lobes often overlapping.

Downy Poplar. (*Populus heterophylla*.)

- 139 a. Branches densely hairy; bark on trunk usually spotted.

Paper Mulberry. (*Broussonetia papyrifera*.)

- b. Branches not hairy; bark not spotted.....140.
 140 a. Mature leaves dull green on upper surface, often rough.

Red Mulberry. (*Morus rubra*.)

- b. Mature leaves usually shining and smooth on upper surface.

White Mulberry. (*Morus alba*.)

- 141 a. Mature leaves shining on both sides, not hairy, ovate to lanceolate; twigs shining.....**Shining Willow.** (*Salix lucida*.)
 b. Mature leaves not shining on both sides.....142.
 142 a. Leaves green on both sides, not conspicuously lighter colored beneath; branchlets pale yellow; leaves 1/4-3/4 in. broad, narrowly lanceolate.

Black Willow. (*Salix nigra*.)

- b. Leaves conspicuously lighter colored beneath.....143.
 143 a. Leaves 1/4-1/2 in. broad, 3-7 in. long, very pale beneath; twigs slender and drooping.....**Weeping Willow.** (*Salix babylonica*.)
 b. Trees not completely as in a.....144.
 144 a. Mature leaves 3/4-2 in. broad, very pale beneath.

Pussy Willow. (*Salix discolor*.)

- b. Mature leaves 1/2-3/4 in. broad.145.
 145 a. Large trees with twigs usually shining yellow...**White Yellow.** (*Salix alba*.)
 b. Slender trees with twigs reddish-green, very brittle at the base.

Crack Willow. (*Salix fragilis*.)